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EBU COMMENTS TO THE RSPG OPINION ON

The introduction of Multimedia Services in particular in the frequency bands allocated to the broadcasting services

Summary

The EBU welcomes the opportunity to present its comments on the Radio Spectrum Policy Group (RSPG) opinion on the introduction of multimedia services in particular in the frequency bands allocated to the broadcasting services.

The EBU considers that multimedia services are promising new applications which can enhance the digital broadcasting offer. Broadcasters are promoting the development of broadcasting technologies such as T-DMB and DVB-H to provide 'broadcast' mobile multimedia services (e.g. mobile TV) and are also actively participating in different field trials and projects, including as network operators. The EBU welcomes the RSPG initiative to encourage the development and introduction of these new services.

The EBU agrees with the RSPG opinion that one of the main handicaps for the development of multimedia services is the allocation of adequate and harmonised spectrum since most of the more appropriate frequency bands for such applications are already heavily used. The broadcasting bands Band III and Bands IV/V have good propagation characteristics for multimedia services but it would be only after the analogue switch off and the end of the transition period that there may be some sub-bands that could be reallocated to T-DMB or DVB-H services and then only in certain countries. However it is not certain that there will be enough spectrum to permit attractive enough offers to be provided for users, and sufficient for operators to justify their investments. The broadcasting L-Band would be available in the shorter term but it has the additional constraint that the Maastricht 2002 Special Arrangement may need to be revised.

The EBU welcomes initiatives to facilitate access to the spectrum and agrees with the RSPG that any approach taken at European level must take account of the wide variety of national situations in terms of different use and future availability of the spectrum, in terms of different regulatory policies and different timescales.

The EBU agrees with the RSPG that flexibility in the use of the spectrum is essential to allow for future technological developments such as multimedia services. However, the EBU has some concerns concerning the RSPG opinion that the introduction of multimedia services may be facilitated by relaxing constraints in issuing licenses. Without adequate technical constraints, applying this approach in a general manner to the broadcasting bands could result in unacceptable interference problems and therefore reduce the efficiency of use of the spectrum. Flexibility in the access to the spectrum together with respect for interference and compatibility issues could be achieved by other means such as allotment planning and the envelope concept used in the new GE06 Agreement.

The EBU is analysing approaches which could facilitate the introduction of broadcast multimedia services in the near future and remains at the disposal of interested parties for future discussions.

Multimedia services

The main role of public service broadcasters is to ensure cultural diversity, media pluralism and balanced information. They have the obligation to provide their programmes and services to all sections of the population, i.e. to every citizen, wherever he or she may be and whatever platform or device he or she may use for receiving them. This is a direct consequence of the principle of universality, which in turn is one of the pillars of the public service broadcasting remit. This entitles public service broadcasters to use new media platforms and to offer new media content services including multimedia services.

Multimedia services can be provided using the new digital broadcast technologies T-DMB and DVB-H Standards. These technologies optimise the transmission of the broadcast content to handheld receivers providing what we call **'broadcast' mobile multimedia services**. These services may also include interactive programmes. A return channel could be provided, preferably by mobile telecommunication standards (GSM or UMTS) since the use of broadcast spectrum for uplink communications would result in additional constraints for frequency planning. However, it should be noted that interactive applications do not necessarily need a return channel (e. g. MHP).

Multimedia services can also be provided using other digital technologies such as the UMTS Standard. Such technology also permits the transmission of the broadcast content to handheld receivers in what we call **mobile 'telephony' multimedia services**.

The EBU would like to stress that, from a technical point of view, even in a technological convergence environment, a clear difference should be recognised between 'broadcast' mobile multimedia services and mobile 'telephony' multimedia services. Traditional broadcasting is based on point-to-multipoint networks that use high power transmitters to cover a large area. Mobile telephony is based on point-to-point networks with return uplink channels and they are planned with small coverage cells and lower power transmitters. Due to the fact that these two systems are of an entirely different nature, the sharing of the same frequency bands would impose important technical constraints to the frequency planning and therefore reduce the efficiency of the spectrum use.

As far as the regulatory aspect is concerned, the EBU agrees that the regulatory framework for electronic communications networks (the Telecom package) and the regulatory framework for content (the Television without Frontiers Directive) are complementary but that they remain separate because they deal with two different aspects: networks and content. However, some important links exist between the two, and particularly in a converging environment.

It must be stressed that the Telecom package already takes into account convergence as it applies to all transmission infrastructures (including broadcasting networks) irrespective of the types of service carried over them. This is not the case with the current Television without Frontiers Directive, although the Commission proposal for an Audiovisual Media Services Directive takes account of convergence and avoids the application of different rules depending on which type of technology or network infrastructure or platform is used, or depending on who the service provider is (e.g. irrespective of whether his main activity is broadcasting or communications). What rightly matters is the content of the service, its public availability and its purpose of informing, entertaining or educating. The graduated approach of the draft Audiovisual Media Services Directive, which involves applying a set of essential requirements for all audiovisual media services, combined with more detailed rules for television, ensures that regulation is proportionate and adapted to the characteristics of linear audiovisual services (broadcasting services) and non-linear audiovisual services (on-demand services), now and for the foreseeable future.

Spectrum options

The RSPG Opinion analyses the possibilities for introducing multimedia services in several frequency bands.

The broadcasting Band III (174-230 MHz)

This band has been planned by the GE06 Agreement for T-DAB and DVB-T services. In most European countries 2 to 3 T-DAB layers for portable indoor reception have been possible. In some countries, an additional DVB-T layer has also been possible.

Due to its propagation advantages, Band III offers the best characteristics for mobile reception where the Doppler effect is reduced, although the receive antenna gain in this band is lower than in other frequency bands.

The use of T-DAB or DVB-T entries in the GE06 Agreement for **'broadcast' mobile multimedia services** using T-DMB or DVB-H Standards would be possible because the Agreement provides such flexibility through its Article 5. Paragraph §5.1.3¹ of Article 5 states that *"a digital entry in the Plan may also be notified with characteristics different from those appearing in the Plan for transmissions in the broadcasting service [...] provided that the peak power density in any 4 kHz of the above-mentioned notified assignments shall not exceed the spectral power density in the same 4 kHz of the digital entry in the Plan"*.

However, Band III presents a complex frequency planning situation:

- small number of channels available,
- DVB-T and T-DAB will have to co-exist while at the same time protecting analogue stations used in non-European neighbouring countries not planning for an end of the transition period until 2020,
- there has been a unification to a 7 MHz channel raster in most European countries, but there are still countries using a 8 MHz channel raster and therefore there are overlapping channels in the frequency plan,
- parts of the band are used by other services (e.g. PMR) and there are constraints from adjacent bands (e. g. military services) in some countries.

It should be noted that the availability of this band for **'broadcast' mobile multimedia services** might be greater for those countries which have not started yet T-DAB or which would wish to implement T-DMB services in replacement of their T-DAB services.

Concerning the use of T-DAB or DVB-T entries in the GE06 Agreement for **mobile 'telephony' multimedia services**, paragraph §5.1.3 of Article 5 of the GE06 Agreement also states: *"a digital entry in the Plan may also be notified with characteristics different from those appearing in the Plan for transmissions [...] in other primary terrestrial services operating in conformity with the Radio Regulations provided that the peak power density in any 4 kHz of the above-mentioned notified assignments shall not exceed the spectral power density in the same 4 kHz of the digital entry in the Plan"*. In the case of mobile multimedia services the process is expected to be longer as, prior the start of services under GE06 Plan, the mobile service has to be allocated on a primary bases to that band by the Radio Regulations unless a coordination agreement is signed with potentially affected neighbouring countries.

¹ Procedure based on the so-called 'envelop concept' proposed by the CEPT.

From a technical point of view, EBU agrees with the RSPG opinion that mobile uplink transmissions would require separation from DVB-T and T-DAB with guard bands, making their coexistence and coordination difficult and therefore reducing the efficiency of the spectrum use.

The broadcasting Bands IV/V (470-862 MHz)

These bands have been planned by the GE06 Agreement for DVB-T services. In most European countries 8 layers for fixed or portable reception have been possible. In some countries, some additional DVB-T layers with reduced coverage have also been possible.

These bands have better propagation characteristics than higher frequency bands and compared to Band III, offer better performance of the receive antenna gain.

The frequency planning situation is also less complex than in Band III:

- higher number of channels available,
- DVB-T will have to protect analogue stations only until the end of the transition period in 2015,
- there is a unique 8 MHz channel raster.

Although the bands are technically attractive for multimedia services, the spectrum availability will be different from country to country depending mainly on:

- the success of DVB-T services. To provide an attractive offer all the spectrum in the band is needed. The more attractive the offer is from the start, the greater opportunities for success. EBU wants to stress the point that in GE06 the entire spectrum available in this band has been planned for DVB-T. The requirements submitted by most countries far exceeded the spectrum available and in many cases countries had to reduce the number of requirements or accept a reduced coverage. The large number of requirements for digital broadcasting (that also applies for Band III) reflects the fact that in most countries the digital dividend is intended to be used to increase the number of programme services provided and to enhance the digital television offer (e.g. portable indoor reception, HDTV). In some countries, this has already started to be implemented.
- sharing with other primary services. The band is already shared with other services and some new services are also showing interest (e.g. WiMAX, BSS).
- additional interferers (e.g. license-exempt services such as SRDs, UWB devices, power wiring communication systems). These additional interferers reduce the spectrum available for broadcasting services and reduce the coverage of the service area.

As in Band III, the use of DVB-T entries in the GE06 Agreement for **'broadcast' mobile multimedia services** using the DVB-H Standard would be possible because the Agreement provides such flexibility through its Article 5. However, the Agreement has planned for different planning configurations allowing to each country to choose the parameters (i.e. reception mode, system variant and data capacity) that better suited their national needs. We agree with the RSPG opinion that since the power levels for different planning configurations are very different, the choice made may have some consequences for future implementation of new configurations such as to require additional costs at transmitter sites or a reduction of the number of layers.

As in Band III, the application of Article 5 for the use of DVB-T entries in the GE06 Agreement for **mobile 'telephony' multimedia services** may be a longer process as it requires the mobile service to be allocated in the bands in the Radio Regulations unless a coordination agreement

is signed with potentially affected neighbouring countries. From a technical point of view, mobile uplink transmissions would require guard bands with DVB-T making their coexistence and coordination difficult and therefore reducing the efficiency of the spectrum use.

An additional and important constraint in these bands due to handset design (and cost) is the guard band required between the channels used for television reception (downlink) and the transmission from the handset (uplink) in the 900 MHz band.

The Broadcasting L-Band (1452-1492 MHz)

The band 1452-1479.5 MHz is currently planned for T-DAB services in Europe subject to the Maastricht 2002 Special Agreement (MA02). This band would be an interesting candidate for multimedia services as only a few European countries have started commercial T-DAB emissions and there would be scope for harmonisation of frequencies at a pan-European level. The main constraints would be:

- The bandwidth available (27.5 MHz) might not be enough to develop an attractive multimedia offer.
- The MA02 Arrangement planned for T-DAB mobile reception and is restrictive in the use of the band by other technologies. A revision may be needed for use by multimedia services.

The band 1479.5-1492 MHz is reserved for S-DAB use and several projects are under consideration. The use of this band for terrestrial services would be difficult as current regulations require protection of reception from those satellite systems.

Other bands not allocated to the broadcasting service

The bands identified for IMT-2000 at 2 GHz and 2.5 GHz are available and substantially unused across the EU and would also be interesting candidates for **'broadcast' mobile multimedia services**. However, these bands are allocated to the mobile service and in some countries parts of the band have already been licensed to mobile operators for UMTS applications.

As mentioned previously, from a technical point of view, the coexistence of point-to-multipoint networks with point-to point networks may require guard bands which would decrease the spectrum use efficiency. Further studies are needed to analyse the compatibility between these different systems. The use of these bands only for mobile multimedia services would simplify the frequency planning and would maximise the efficient use of the spectrum.

The same would apply to the bands allocated to the mobile-satellite, mobile and fixed services at 1980-2010 MHz and 2170-2200 MHz.

Harmonisation

The EBU agrees that harmonisation of frequencies for multimedia services at pan-European level would provide benefits in antenna design and in reducing costs for manufacturers.

The use of the frequencies in the broadcasting Band III and Bands IV/V has been harmonised for digital broadcasting by the GE06 Agreement. **The Agreement has harmonised the technical parameters for digital broadcasting and at the same time has introduced flexibility for future systems.** The frequency allocations in the GE06 Agreement are

particular to each country as they also take account of national needs and, in many countries, of existing infrastructure to reduce costs for the digital switchover.

Harmonisation of a given sub-band for multimedia services would reduce flexibility for other national requirements and would imply:

- a rearrangement of channels in all countries and consequently important investments in new transmitters, and
- depending on the band to be harmonised, coordination with other primary services that share the band.

The situation in the L-Band and in the 2 GHz and 2.5 GHz bands is simpler since there are only some commercial transmissions in a few countries. In these bands, there would be scope for pan-European harmonisation.

Solutions

In summary, there is a shortage of frequencies for **'broadcast' multimedia services**. After the end of the transition period in Band III (not before 2020 in certain areas) and in Bands IV/V (not before 2015), there may be in certain countries some sub-bands that could be reallocated to T-DMB or DVB-H services but it is not certain that there will be enough spectrum to provide offers attractive enough for users and for operators to justify their investments.

In the L-Band, some spectrum could be made available in the shorter term but this would be of relatively small amount. Additionally, a revision of the MA02 Arrangement may be needed.

The situation might be simpler for **mobile 'telephony' multimedia services** as they could start in the short term in the band allocated to IMT 2000 at 2 GHz and 2.5 GHz.

The use of the broadcasting bands by mobile 'telephony' multimedia services is not recommended as it would impose important technical constraints to the frequency planning because mobile services are based on the use of small coverage cells and low power transmitters in contrast to broadcasting networks which are developed on the basis of large cells and relatively high power transmitters.

The solution proposed in the RSPG opinion to facilitate the introduction of multimedia services is to reduce constraints in issuing licenses. The EBU wants to stress the point that introducing this approach to the broadcasting bands could result in unacceptable interference problems and therefore reduce the efficient use of the spectrum. The EBU agrees that flexibility in the use of the spectrum is essential to allow for future technological developments. However, flexibility in the access to the spectrum, together with respect of interference and compatibility issues, is achieved by existing spectrum management regulations and by approaches such as allotment planning and the envelop concept currently used in the GE06 Agreement.

The EBU is aware of the importance that multimedia services may take in the near future and is studying in depth the possibilities of facilitating the development of multimedia services under the new GE06 Agreement and the options that a revision of the MA02 Agreement may open to those services. The EBU remains at the disposal of interested parties for further discussions and is keen to participate actively in all groups addressing the introduction of multimedia services.